

**CLAIMS**

1. A process for the preparation of a synthesis gas containing hydrogen and carbon monoxide by a combination of catalytic partial oxidation and further an autothermal reforming process, comprising

(a) providing separate streams of predetermined proportions of a hydrocarbon feedstock, an oxygen source and of process steam,

(b) injecting said separate streams into a catalytic partial oxidation reaction zone to react, and to form a prereformed product stream,

(c) introducing the prereformed product and a predetermined proportion of a second oxygen source into a further partial oxidation process step forming a further partially oxidised process stream by flame reactions,

(d) reacting the further partially oxidised process stream in the reaction zone constituting a steam reforming process step to form a synthesis gas product stream, and

(e) withdrawing the synthesis gas product stream from the further partial oxidation process step and the steam reforming process step, the two steps constituting the autothermal reforming process.

2. A process according to claim 1, wherein further stream(s) of hydrocarbon and/or steam is injected at predetermined proportion to the second step of partial oxidation.

3. A process according to claim 2, wherein the amount of carbon in the second stream of hydrocarbon is not higher than 30% of the total of carbon fed to the further partial oxidation process step in step c.

5

4. A process according to claim 1, wherein the operation pressure is between 5 and 30 bar, the  $O_2/C$  inlet the process step of catalytic partial oxidation is between 0.5 and 0.9 and the steam to carbon ratio inlet the process step of catalytic partial oxidation is between 0 and 3.

10

5. A process according to claim 1, wherein the operation pressure is between 10 and 30 bar, the  $O_2/C$  inlet the process step of catalytic partial oxidation is between 0.55 and 0.7 and the steam to carbon ratio inlet the process step of catalytic partial oxidation is between 0.2 and 1.5.

15

T03759-CH060